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SYNTHETIC FUEL PRODUCTION IN WEST GERMANY

DISCUSSES PROBLEMS OF SYNTHETIC FUEL MANUFACTURE -- Munich, Die Neue Zeitung, 27 Apr 51

Before the war, two groups of plants producing synthetic fuel had been opened in the Ruhr area. The first group, employing the Bergius-Bosch hydrogenation process, used coal as the raw material. The three plants comprising this first group were Gelsenberg, near Buer; Scholven, near Buer; and Ruhroel GmbH, near Bottrop.

The plants of this group have the advantage of being able to use either coal or crude oil as the basis for fuel production. At present, the three plants do not intend to use coal, because it is possible to produce high-grade fuel more cheaply from imported crude oil (the price of coal has risen since 1938 by 150 percent, that of crude oil, only 30 percent).

Compared to the cracking process, hydrogenation has the advantage of a greater yield of fuel:

Primary Product	Fuel Yield (%)	
	Hydrogenation	Cracking
Emoland oil	90	66
Near East oil	94	75

On the other hand, the hydrogenation process is more expensive than cracking. So that the hydrogenation plants might be adaptable to changing supply situations, they have now added cracking equipment and are able to switch from one process to the other.

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The second group, employing the Fischer-Tropsch process, consists of Rheinpreussen Chemische Werke, near Moers; Ruhr-Chemie AG, Oberhausen-Holten; Krupp Treibstoffwerk GmbH, Wanne-Eickel; Gewerkschaft Viktor, Castrop-Rauxel; Dortmunder Paraffinwerke GmbH, Dortmund; and Chemische Werke Essener Steinkohle, Bergkamen.

The situation of this group is more difficult because it remains dependent on coal for its Fischer-Tropsch process. The problem consists of the high price of coal and the large quantities of coal needed. At the present stage of development of the Fischer-Tropsch process, 5.5 tons of coke and 1.3 tons of coal are needed to produce one ton of primary product. Considering the coking factor, this corresponds to 8.6 tons of coal per ton of primary product. Coal costs 320-330 Deutsche marks per ton of primary product and constitutes one third of the total cost.

On the other hand, one ton of crude oil, as the primary product for fuel production, costs only 110-115 Deutsche marks c.i.f. North Seaport, as well as a considerable sum for freight from the port to the inland plant. Some of the plants, therefore, have tried, even before the lifting of the hydrogenation ban by the Allies, to find new processes giving a higher yield of fuel in the synthesis from coal.

For example, the Krupp Treibstoffwerke intend to use only part of their Fischer-Tropsch plant, and that only until the conversion to the "Oxyl" process for the production of higher hydrocarbons has been completed. The Essener Steinkohle Chemische Werke intend to start operations with a new process for the catalytic treatment of coke-oven gas, whereby certain quantities of valuable liquid products, consisting primarily of hydrocarbons and alcohols, are gained. On the other hand, Ruhr-Chemie seems to be engaged in extensive plans and research for the modernization of its Fischer-Tropsch installations, aiming at a high yield of fuel. According to statements by the management, it is the intention to decrease the noncoal cost factors in the production of the Fischer-Tropsch primary product, while at the same time increasing the quality and yield of the fuel. This improved Fischer-Tropsch process will be used in the fuel plant to be erected for SASOL (joint project of Ruhr-Chemie, Lurgi-Gesellschaft of Frankfurt, and the W. Kellogg Company, a US firm in the Orange Free State).

There is little information so far about the improved Fischer-Tropsch process. Tentatively, the following may be said: the cobalt of the catalysts will be replaced by iron, and the capacity of the chambers will be increased from the present charge of 2 tons of primary product to 50 tons. The fuel yield is assumed to be about 66 percent of the primary product, which would correspond to the yield from Emuland oil in the cracking process. Presumably, coal consumption also will be reduced. Furthermore, attempts are being made to utilize waste bituminous coal with up to 25-percent ash content, which, heretofore, has not been marketable. It is hoped, thereby, to decrease the total outlay for coal.

DEVELOP NEW SYNTHETIC-GASOLINE PROCESS -- Duesseldorf, Verkehrs-Wirtschaft, 12 Oct 51

According to the director of the Rheinpreussen Chemische Werke in Homberg/Niederrhein, Dr Herbert Koelbel, experiments have been completed on the process for the production of synthetic gasoline which he and the chemist, Dr Friedrich Engelhardt, have recently discovered. According to Dr Koelbel, who for many years was assistant to Professor Fischer (of the Fischer-Tropsch process), the newly discovered process for producing gasoline from carbon monoxide and water vapor is the first basic innovation since 1925 in the production of synthetic gasoline from the gasification products of coal. A great future can be

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predicted for the new process should the technical small-scale experiments prove it possible to produce gasoline from ordinary illuminating or producer gas. Whether this will be technically possible and whether the results will be satisfactory depends, however, on certain imponderables.

The Koelbel-Engelhardt gasoline would not be measurably cheaper than the gasoline produced from petroleum, but it would nevertheless be cheaper to produce than any other synthetic fuels. The preliminary experiments are said to have proved that the new product is well adapted to combustion engines and is, therefore, well able to compete with ordinary commercial gasoline. No prediction can be made at this stage of the experimental work concerning the time interval required to put the new product into commercial production.

NEW PROCESS SUCCEEDS -- Frankfurt, Die Neue Zeitung, 28 Sep 51

Through the further development of the Fischer-Tropsch synthesis, gasoline from water and carbon monoxide gas has been successfully produced. The new process, which will be announced at the annual convention of the German Chemical Society, is based on the development of a new catalyst by Dr Hans Koelbel and Dr Friedrich Engelhardt at the Rheinpreussen Chemische Werke in Homberg/Niederrhein.

Synthetic gasoline based on the Fischer-Tropsch process has, heretofore, been produced from expensive hydrogen and cheap carbon monoxide. In the new synthesis, a mixture of steam and carbon monoxide, after catalysis, can, depending on pressure and temperature, be changed in one step to gasoline, paraffins, oil products, or similar materials, as well as alcohol.

The decrease in expense is enormous. From one cubic meter [sic] of carbon monoxide, 215 grams of gasoline or other desired materials are said to be produced.

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